

existence of an outer layer of resin surrounding the core. The outer layer is said to be inherently disclosed because a vinyl-alcohol tape is wound around the resin-impregnated core following twisting of the core.

Claim 7 is rejected under 35 U.S.C. §103(a) as being unpatentable over Taylor in view of U.S. Patent No. 4,763,882 to Nishiyama et al, which is cited as teaching a spring wire having a rectangular cross section.

Similarly, claim 10 is rejected under §103(a) as being unpatentable over Taylor in view of U.S. Patent No. 3,378,426 to Medney, which is cited as teaching fibers made of glass.

REMARKS/ARGUMENTS

Applicants thank the Examiner for the careful consideration given the Parent Application, and respectfully submit that the issues raised in the outstanding Office action are addressed by the following remarks. All references herein to claim rejections refer to the rejections issued in the outstanding Office action for the Parent Application.

Turning first to the issues raised with regard to Claim 1 in the Parent Application, applicants note that Claim 1 in the present application differs from that in the Parent. Claim 1 now recites the limitation of an outer layer having a thickness that varies along the longitudinal axis to form a generally uniform outer surface. The Taylor patent does not teach this feature but instead teaches an outer layer having a uniform thickness along the longitudinal axis. This is evident from the illustration in Figs. 3 and 9, where it is observed that the underlying contours of the rope are visible externally of the outer layer. It is apparent that the underlying contours would not be visible if the thickness of the outer layer in Taylor varied to provide a generally uniform outer surface such as that recited in Claim 1. This observation is supported by the specification of Taylor, where it is explained that the illustration shown in Figure 9 is of the rope *after having been saturated with a suitable binder* in the manner described earlier in Taylor. See Col. 5, Lines 10-18 (emphasis added). None of the processing steps disclosed in Taylor would result in, or even suggest the formation of a generally uniform outer surface as the result

of an outer layer of varying thickness. Accordingly, Applicant respectfully submits that Claim 1 in the present application is allowable over Taylor.

With regard to Claims 12 and 24, both of these claims recite the limitation of twisting the core within a cavity to form the spring wire. As is noted in the outstanding Office action, Taylor fails to disclose the formation of the outer layer by twisting the core to squeeze the resin from the core within the cavity. Accordingly, neither claim 12 nor claim 24 is anticipated by Taylor.

Claim 1 was also rejected in the Office action as being either anticipated by or rendered obvious by the Hashimoto patent. It is stated in the Office action that an outer layer substantially devoid of fibers and having a variable thickness is inherently taught by Hashimoto. However, Hashimoto fails to discuss either the fact that the outer layer is devoid of fibers or that the outer layer has a variable thickness. In contrast, Hashimoto discloses a method of forming a fiber reinforced spring that would produce an outer layer including fibers. Further, the method according to Hashimoto would not control the thickness of the outer layer as claimed in Claim 1 of the present application. This is apparent from the disclosure in Hashimoto where it is stated that a vinyl alcohol tape is wound on the rod shaped fiber bundle after the rod shaped fiber bundle was twisted to achieve the desired elastic characteristics. Thus, the twisting and therefore the squeezing of the resin from the fiber bundle is completed before the fiber bundle is disposed within the vinyl alcohol tape. Col. 3 lines 3-14. Accordingly, Applicant respectfully submits that an outer layer of resin substantially devoid of fibers and having a variable thickness along the longitudinal axis as claimed in Claim 1 is not inherently taught by Hashimoto.

Finally, Claim 28 of the present application is directed to a composite spring including an outer layer of resin having a generally uniform outer surface, wherein shearing stress on said composite spring resulting from an applied load is generally constant along said spring wire. It is evident from the specification of the present application that the shearing stress is inversely proportional to the diameter of the spring wire raised to the third power. Because of this inverse exponential relationship small variations in the spring wire diameter will produce significant changes in the shearing stress along the spring wire. As a result, the spring disclosed by Taylor having several locations that include an imperfection will not provide a spring having a generally

constant shearing stress along the length of the spring wire. Accordingly, Applicant respectfully submits that Claim 28 is in a condition for allowance.


In light of the foregoing, independent claims 1, 12, 21, 26 and 28 should be in a condition for allowance. The remaining dependent claims should be allowable for the limitations therein and for the limitations of the claims from which they depend. Notice to that effect is hereby requested.

In the event that issues remain unresolved after consideration of this communication, the Examiner is requested to contact the undersigned to arrange for a telephone interview to expedite disposition of this application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge any payment or credit any overpayment to Deposit Account No. 500959, our reference 089498.0354CIP for any fees required under 35 C.F.R. §1.16 or 1.17.

Respectfully submitted,

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